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Trichopteran fauna in a region of Central-Southern Italy: Molise¹

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A b s t r a c t : The first list of Trichoptera from the Molise region is reported. It is the result of research carried out from 1962 to 2005 in 68 sampling sites: 64 lotic, 3 lentic, 1 hypogean. The lotic sampling sites include 10 springs and 54 watercourses. The lentic sites include 1 marsh and 2 mountain pools. 64 species and 5 subspecies from 15 families were collected. 57 species of different ecological categories are found only in lotic biotopes, 11 only in lentic biotopes and 1 species of *Stenophylax* in a hypogean cavity. The species belong to several chorological categories. 15 species and 5 subspecies are endemic to the Italian fauna. 3 of these are limited to the regions of the southern Apennines, including *Rhyacophila dorsalis pantinii* VALLE, 2001 endemic only to Molise and Campania (River Volturno). The presence of *Hydroptila tigurina* RIS, 1894, collected with light traps in the river Trigno, is noteworthy because it is a rare species in Italy.

K e y w o r d s : Trichoptera, Molise, Southern Italy, checklist, ecology, chorology.

Introduction

The first collections of Trichoptera in Molise were made in 1962 in a watercourse in the southern region (T. Tammaro, CB) by S. Ruffo (MORETTI et al. 1998) and in 1971 in a hypogean cavity (Pozzo della Neve, Matese, CB) by A. Antonelli (CIANFICCONI & MORETTI 1985). From 1969 to 1993 the research was carried out by undergraduate students of the former Istituto di Zoologia dell'Università di Perugia in several sites of the watercourses: Biferno (A. Pangia 1969-70; E. Zarelli 1970-71; M.A. Baccaro 1995-96), Cigno (M. Mastrogiuseppe 1974-75; R. Lanese 1990-91); Tappino (A.M. Cutrone 1979-80); Carpino (G. Salvatore 1988-89); Sangro and mountain pools (N. Iannaccio 1989-90), Trigno (T. De Fanis 1992-93). The adult and aquatic stage specimens were classified by G.P. MORETTI. Later the research was extended to the Zittola marsh (PANNUNZIO et al. 1998) and to the rivers Trigno and Volturno (VALLE 2001). BOTOSANEANU (2004) and MALICKY (2005) have published recent findings in Molise. Lists of Trichoptera from Molise can be deduced from the Italian checklists (MORETTI & CIANFICCONI 1981; CIANFICCONI & MORETTI 1991; CIANFICCONI 2006).

Based on published and unpublished data, this paper proposes a first faunistic, ecological and chorological balance of the hydrographic system of the Molise region.

¹ This paper is dedicated to Prof. Dr. Hans Malicky on the occasion of his 75th birthday.

Basin Fiume Sangro

- 29 b - ≈ Palude della Zittola, Montenero Valcocchiara, IS, 820 m (6)
- 3 - + Rio Verde, Pescopennattaro, IS, 1040 m (6)
- 4 - ★ Fonte Quarto, Pescopennattaro, IS, 1030 m (3)
- 6 - ★ Fonte Gallina, Pescopennattaro, IS, 1040 m (5)
- 9 - + Fiume Sangro, Isola fonte delle Luna, IS, 750 m (1)
- 9 a - + Capracotta, IS, 1200 m (1)

Basin Fiume Trigno

- 15 - ★ Sorgente Fiume Trigno, Capo di Trigno, Vastogirardi, IS, 1100 m (8)
- 12 - ★ Sorgente Torrente S. Angelo, tributario Fiume Trigno, Vastogisardi, IS, 1200 m (10)
- 20 - + Torrente Salcitaro, affluente Fiume Trigno, bosco di Collemeluccio, IS, 850 m (9)
- 23 - ★ Fonte Cupa, cantoniera S.S. 86, IS, 930 m (2)
- 26 - + Fiume Trigno, a valle confluenza Torrente Salcitaro, Bosco di Collemeluccio, IS, 790 m (1)
- 28 - + Fiume Trigno, Ponte Nuovo, Chiauci, IS, 884 m (1)
- 27 - + Fiume Trigno, Civitanova del Sannio, IS, 650 m (8)
- 24 - + Fiume Trigno, a valle confluenza Torrente Verrino, Bagnoli del Trigno, IS, 600 m (8)
- 19 - + Fiume Trigno, contrada valle Cupa, Salcito, IS, 590 m (6)
- 19a - + Bagnoli del Trigno, IS, 470 m (1)
- 19b - + Fiume Trigno, Trivento, CB, 250 m (1) L

Basin Fiume Biferno

- 52a - ★ Sorgente Maiella, Boiano, CB, 500 m (9)
- 52 - ★ Sorgente Pietre Cadute, Boiano, CB, 480 m (20)
- 54 - + Rio Freddo, Boiano, CB, 490 m (3)
- 53 - ★ Sorgente S. Maria in Rivoli, Boiano, CB, 480 m (13)
- 53a - + Torrente Calderone, confluenza sorgenti Maiella e S. Maria Rivoli, CB, 500 m (10)
- 55 - ★ Sorgente Capo d'Acqua, Campitello Matese, CB, 1430 m (1)
- 51 - + Torrente Callora, S. Massimo, CB, 540 m (1)
- 47 - + Fosso Il Rio, affluente Torrente Callora, Boiano, CB, 450 m (2)
- 50 - + Torrente Callora, contrada Tre Casette, Boiano, CB, 450 m (4)
- 58 - + Torrente Rio vivo, Guardiaregia, CB, 800 m (2)
- 56 - + Torrente Quirino, Guardiaregia, CB, 475 m (2)
- 44 - + Fiume Biferno, Incisa - Baranello, Coscia di Ponte, CB, 460 m (1)
- 35 - + Fiume Biferno, Castropignano, svincolo per Oratino, CB, 200 m (1)
- 22 - + Fiume Biferno, contrada DeFenzo, Lucito, CB, 430 m (1)
- 13 - + Fiume Biferno, fondo valle Biferno, Lupara, CB, 460 m (2)
- 1 - + Fiume Biferno, contrada Mattonelle, Portocannone, CB, 32 m (3)
- 16 - + Torrente Cigno, a valle confluenza. Fosso Gerione, Casacalenda, CB, 560 m (5)
- 14 - + Torrente Cigno, Civitella, CB, 327 m (1)
- 11 - + Torrente Cigno, valle Cerioso, Ponte S.S. Larino-Montorio nei Frantani, CB, 290 m (1)
- 10 - + Torrente Cigno, Masseria Vitello, Montorio, CB, 258 m (7)
- 8 - + Torrente Cigno, Ponte di Rotello, colle Fara-Rotello, CB, 168 m (7)
- 7 - + Torrente Cigno, Ponte S.S. Larino-Urutri, CB, 130 m (1)
- 2 - + Torrente Cigno, tra Fara di Cigno e S. Martino in Pensilis, CB, 34-62 m (1)

Basin Fiume Fortore

- 48 - + Torrente Tappino, Terrazzano, CB, 700 m (1)
- 49 - + Torrente Tappino, Mirabello Sannitico, CB, 500 m (1)
- 42 - + Torrente Tappino, Toro, CB, 600 m (1)
- 41 - + Torrente Tappino, confluenza Torrente Carapello, Pietracatella, CB, 400 (1)
- 46 - + Torrente Carapello, tributario Torrente Tappino, Jelsi, CB, 270 m (5)
- 43 - + Torrente Tappino, a valle confluenza Torrente Carapello, Masseria Scalero, CB, 240 m (1)
- 45 - + Fiume Tappino, a monte confluenza Fiume Fortore, bivio Gambatesa, 210 m (1)
- 25 - ★ Sorgente Fisca, Torrente Tona, Rotello, CB, 600 m (7)
- 21 - + Torrente Tona, vallone Porcino, Bonefro, CB, 500 m (4)
- 18 - + Torrente Tona, Ponte della Tona, Bonefro, CB, 400 m (4)
- 17 - + Torrente Tona, Rotello, CB, 240-300 m (13)

Basin Fiume Volturno

- 29 - + Fiume Volturno, tratto superiore, Cerro al Volturno, IS, 570 m (1)
- 29 a - + Fiume Volturno, Colli a Volturno, c/o Ponte Sbiego, IS, 300 m (1)
- 30 - + Fiume Vandra, Pte delle Mandra, IS, 880 m (1)
- 30 a - + Fiume Vandra, IS, 420 m (1)
- 32 - + Rio Frazzini, Riserva Naturale di Monte Mezzo, IS, 900 m (1)
- 31 - + Fiume Carpino, tratto sorgivo, Sessano, Montenero Valcoccchiara IS, 805 m (4)
- 33 - + Torrente Molina, affluente Fiume Carpino, Sessano, IS, 720 m (1)
- 34 - + Fiume Carpino, Sessano, IS, 700 m (5)
- 37 - + Fiume Carpino, Carpinone, IS, 680 m (4)
- 40 - + Torrente Tura, affluente Fiume Carpino, Carpinone, IS, 630 m (1)
- 39 - + Fiume Carpino, Pontenovo, IS, 510 m (4)
- 38 - + Fiume Carpino, Pettoranello del Molise, IS, 630 m (6)
- 57 - + Torrente Tamaro, Sassinoro, CB, 500 m (1)

Mountain pools

- 5 - ● Laghi dell'Anatra, Pescopennattaro, IS, 1040 m (5)
- 36 - ● Laghi Civitanova, Massiccio del Frosolone, IS, 1130 m (2)

Hypogean cavity

- 59 - ∩ Pozzo della Neve, Matese, CB, 1340 m (1)

The sampling sites are situated in the two provinces Campobasso (CB) and Isernia (IS) and are at different altitudes from 32 m (F. Biferno, site 1) to 1430 m a.s.l. (Sorgente Capo d'Acqua, site 55).

The majority of the sampling sites (64) are located in lotic waters (10 springs, 54 watercourses), 3 in lentic waters, 1 in a hypogean cavity.

The springs of the rivers Biferno and Trigno are diverted into fountains (S. Maria dei Rivoli, site 53) or into the rheocrenous complexes to supply trout farms (Maiella, site 52a) or aqueducts (Sorgente S. Angelo, site 12). The springs (Fonte della Gallina, site 4; Fonte di Quarto, site 6) rise at altitudes above 1000 m in woods with fir trees (*Abies alba* MILLER, 1768).

Of the watercourses investigated F. Biferno flows only through Molise, the other rivers flow through Molise into other regions: Abruzzo (F. Sangro, F. Trigno), Campania (F. Volturno, F. Tamaro) and Puglia (F. Fortore).

The lentic waters are two mountain pools Laghi Civitanova site 36, Lago dell'Anatra site 5 situated above 1000 m and one marsh (the Zittola fed by the river Zittola, a tributary of the river Sangro which is mostly in Abruzzo).

The cave Pozzo della Neve is located in southern Molise at 1300 m a.s.l.

253 samplings were made (245 in lotic waters, 7 in lentic waters and 1 in a hypogean cavity). The highest number of samplings (20) was made at site 52 in the Biferno river.

Materials and methods

Trichoptera were collected randomly or seasonally to prepare graduation theses. Some watercourses were investigated in more than one section and some sites checked more than once in different years.

The aquatic stages (larvae, pupae, empty cases) were collected with a net with a handle or tweezers according to the habitat and typology of the substrate, were fixed in loco in formol 7 % and partly reared in the laboratory until the emergence of the adults.

The adults were collected mainly during the day with an entomological net and a microaspirator in the surrounding vegetation. Only in more recent times the specimens have been collected during the night with light traps (fluorescent and U.V. lamps). Some specimens were fixed in 70° alcohol and others were taken alive to the laboratory for dry conservation.

Catalogue of the Trichoptera in Molise

The species found are listed - subdivided into families - in a catalogue according to the order of the checklist of Italian Trichoptera (CIANFICCONI 2006) updated on the basis of revisions by MALICKY (2004) in the second edition of the Atlas of European Trichoptera. For each species the sampling sites are recorded with the corresponding number in Fig. 1, the date of the samplings in chronological order, the number of adults and aquatic stages (l = larva, p = pupa, pr = prepupa, fpv = empty pupal case, /m² = density per square metre) name of the collector. For published findings, bibliographic data is given. (L) indicates the specimens were collected with light traps. The specimens classified as species by Moretti, are kept in the G.P. Moretti collection in the Biology section of the Dipartimento di Biologia Cellulare e Ambientale dell'Università di Perugia.

Rhyacophilidae

1. *Rhyacophila dorsalis acutidens* McLACHLAN, 1879

Material: **6** - 12.10.1988: 1 ♀ Iannaccio. **19** - 30.8.1991: 5p♂♂, 2pr; 19.7.1992: 32pr, 4 l; 25.8.1992: 25 p, De Fanis. **24** - 30.8.1991: 165p/m²; 19.7.1992: 1p♂; 25.8.1992: 3pr, De Fanis. **26** - 15.5.1989: p♂, Iannaccio. **27** - 5.10.1991: 1p♀; 25.8.1992: 69p, 5 l, De Fanis. **34** - 30.3.1989: 2 l, Salvatore. **35** - 28.9.1969: 3♂♂, Zarelli. **38** - 29.1.1989: 1p♂; 7.3.1989: 1, Salvatore.

A high number of specimens has been found in the River Trigno from the hypocrenal to epirhithral zones. Recorded in western Alps and Apennines from Emilia Romagna to Puglia and Calabria. W-Alpino-Apenninic endemic.

2. *Rhyacophila dorsalis pantinii* VALLE, 2001

Material: **19a** -31.8.2000: 1♂. **35** - 31.8.2000: holotype ♂, allotype ♀, paratypes 2♂♂, 2♀♀ (L), (VALLE 2001), 28.9.1968: 1♂, 9.9.1869: 1♂, Zarelli (coll. Moretti). **44** -31.8.2000: 3♂♂, 17♀♀ (L), (VALLE 2001).

Described by VALLE (2001) after examining specimens collected with light traps in the River Biferno (site 35). Adults collected in the same site in 1968 by Zarelli were considered by Moretti to be a new subspecies which was never published. After revision, the specimens were attributed to this taxon. VALLE (2001) also collected *Rhyacophila dorsalis pantinii* in the river Trigno (site 19a) and in Campania in the rivers Volturno (CS) and Sele (SA). S-Appenninic endemic.

3. *Rhyacophila foliacea* MORETTI, 1981

Material: **1** - 7.1.1991: 1, Lanese. **15** - 5.10.1991: 4p♂♂, 1p, 1l; 19.7.1992: 1♂ (L), 2pr, 2 l; 25.8.1992: 2♂♂, 1p♀, 16pr, 11 l; 1.11.1992: 4♂♂; 18.8.1993: 1p♀, 1pr, 1 l, De Fanis. **33** -28.3.1988: 1p♂, Salvatore. **35** - 22.4.1970: 1; 10.7.1970: 1♂, 1♀; 24.10.1970: 8♂♂, 1♀; 22.7.1971: 1, Zarelli. **40** - 7.3.1989: 1p♀, Salvatore. **44** - 26.9.1970: 14♂♂, 1♀; 24.6.1971: 1, Zarelli. **50** - 10.3.1967: 1p♀, Pangia. **52** - 6.10.1968: 1♂, 2.1.1971: 1, Pangia. **52 a** - 30.10.1995: 2♂♂; 17.6.1996: 1♂, Baccaro. **53 a** - 30.10.1995: 1♂, 1♀, 18.2.1996: 4♂♂; 17.6.1996: 5♀♀, Baccaro. **54** - 23.7.1969: 2p♂♂; 28.9.1970: 3♂♂; 5.10.1970: 15♂♂, 1♀; 28.9.1971: 11♂♂, 2♀♀, Zarelli.

Described by Moretti after examining specimens from Marche. This species is Central-S-Appenninic endemic (from Toscana to Calabria).

4. *Rhyacophila hartigi* MALICKY, 1971

Material: **11** - 19.5.1975: 1♂, Mastrogiuseppe.

It is the northernmost finding of this species also present in Basilicata, Calabria and Sicilia. S-Appenninic-Sicilian endemic.

5. *Rhyacophila rougemonti* McLACHLAN, 1880

Material: **2** - 2.9.1975: 3♀♀, Mastrogiuseppe. **8** - 6.4.1975: 2p♀♀; 20.VI.1975: 1p♂, 1p♀; 21.8.1975: 4♂♂, Mastrogiuseppe. **10** - 13.4.1975: 5♀♀, 6p♂♂ Mastrogiuseppe. **11** - 10.4.1972: 1p♂, 1p♀, Mastrogiuseppe. **15** - 4.2.1992: 1p♀, 1pr; 19.7.1992: 6 l; 1.11.1992: 1♂; 16.11.1992: 1♀; 26.1.1993: 1♂, De Fanis. **28** - 29.10.1991: 1♀, De Fanis. **35** - 15.8.1969: 1p♀, Zarelli. **39** -29.1.1989: 1p♂, Salvatore. **48** - 7.4.1980: 2p♀♀, 22pr, 27 l, Cutrone. **49** - 9.4.1980: 6pr, 1 l, Cutrone. **51** - 27.9.1969: 2♂♂, Zarelli. **53 a** - 18.2.1996: 2♂♂, 3♀♀; 9.4.1996: 1♂, 1♀; 17.6.1996: 2♂♂, Baccaro. **54** - 5.10.1970: 1♀, Zarelli. **56** - 22.7.1969: 1p♀; 23.3.1970: 53pr, Zarelli. 30.10.1995: 1♂, 39♀♀, Baccaro.

Endemic to the Central-S Appennines from Umbria to Calabria and to Sicilia.

6. *Rhyacophila simulatrix* McLACHLAN, 1879

Material: **28** - 30.7.1991: 1p♂, 2p♀♀, 3pr; 14.10.1991: 1♂, De Fanis. **35** - 15.8.1969: 1 l; 28.9.1969: 4♂♂, 1♀; 2.10.1970: 1♂, Zarelli. **44** - 26.9.1970: 1♂, Zarelli. **58** - 19.9.1988: 1p♂, Salvatore.

Present in 16 regions of the Italian peninsula. Centraleuropean distribution.

7. *Rhyacophila vallei* MORETTI, 1997

Material: 29 a - 1.9.2000: 1 ♂ (L) (VALLE 2001).

Described by Moretti after examining specimens collected by Valle in Calabria (Gole del Raganello Civita, CS). It was later found in Molise, Basilicata (F. Noce, PZ) and Campania (F. Trigno, SA) by VALLE (2001). S-Apenninic endemic.

Glossosomatidae

8. *Catagapetus nigrans* MCLACHLAN, 1884

Material: 35 - 10.8.1970: 1 ♂; 3.9.1970: 1 ♂, Zarelli.

It characterizes the springs and spring brooks of the Apennines. Recently found by MALICKY (2002) in the Maritime Alps in France, it is subendemic to geographic Italy W-Alpino-Apenninic Sicilian endemic.

Hydroptilidae

9. *Orthotrichia angustella* (MCLACHLAN, 1865)

Material: 2 - 2.8.1975: 1 ♂, Mastrogiuseppe.

Species found sporadically in Italy (Piemonte, Lombardia, Veneto, Sardegna, Sicilia). Europeo-Mediterranean distribution.

10. *Hydroptila cognata* MOSELY, 1930

Material: 19b - 31.8.2000: 2 ♂ ♂ (L) (VALLE 2001).

Found in Italy in the Alpi Carniche (CIANFICCONI et al. 1999), and in Lombardia (Lago di Garda) by MALICKY (2002).

In 2001 it was collected using light traps in Molise and Toscana (VALLE 2001). W-Mediterranean distribution.

11. *Hydroptila martini* MARSHALL, 1997

Material: 2 - 2.8.1975: 1 ♂, 1 ♀, Mastrogiuseppe.

Found in the rhithral zones of the watercourses in central southern Italy. European distribution.

12. *Hydroptila simulans* MOSELY, 1920

Material: 19b - 31.8.2000: 1 ♂ (L). 29 a - 1.9.2000: 1 ♂ (L) (VALLE 2001).

Found in central Italy and collected with light traps in the rhithral zones of the rivers Trigno and Volturno. European distribution.

13. *Hydroptila tigurina* RIS, 1894

Material: **19 b** - 31.8.2000: 5 ♀ ♀ (L) (VALLE 2001).

Collected for the first time in Italy by VALLE (2001) in Molise and Sicilia. W-European distribution.

Philopotamidae

14. *Wormaldia mediana* MCLACHLAN, 1878

Material: **19** - 1.9.1992: 2 ♀ ♀, De Fanis. **27** - 19.7.1992: 8 ♂ ♂, 4 ♀ ♀, 11 ♂ ♂ (L), De Fanis. **28** - 25.8.1992: 3 ♂ ♂, 1 ♀ ♀, 2 l; 19.7.1992: 2 ♂ ♂, 4 ♀ ♀, 1 l, De Fanis. **35** - 15.8.1969: 2 ♂ ♂, Zarelli. **57** - 9.6.1962: 2 ♂ ♂, 2 ♀ ♀, Ruffo.

Found in hyporhithral and metarhithral zones in the Rivers Trigno, Biferno and Tammaro. The adults fly in summer and are attracted by light traps. Central-S-European distribution.

15. *Wormaldia occipitalis* (PICTET, 1834)

Material: **25** - 6.9.1967: 1 ♂; 28.8.1969: 1 ♂, Pangia.

In Italy it is found in the Alps and in the Apennines as far as Calabria. Central-S-European distribution.

Hydropsychidae

16. *Hydropsyche dinarica* MARINKOVIC, 1979

Material: **15** - 11.5.1993: 1 ♂, De Fanis.

One specimen found in Molise. Present in Italy in Piemonte, Emilia Romagna (MALICKY 2004), Umbria, Basilicata, Calabria, Sicilia. Centraleuropean distribution.

17. *Hydropsyche instabilis* (CURTIS, 1834)

Material: **17** - 22.5.1967: 1 ♂, Pangia. **19** - 30.8.1991: 1 ♀, De Fanis. **21** - 6.8.1968: 1 ♂, Pangia. **27** - 19.7.1992: 1 ♂, 2 l; 25.8.1992: 1 l, De Fanis. **28** - 19.7.1992: 1 ♀, De Fanis. **49** - 9.4.1980: 5 l, Cutrone.

Found in spring brooks and streams in the Alps, Pre-Alps, Apennines, Sicilia, Elba. Euro-Anatolian distribution.

18. *Hydropsyche klefbecki* TJEDER, 1946

Material: **57** - 9.6.1962: 2 ♂ ♂, 1 ♀, Ruffo.

First finding in Molise by Prof. Ruffo. Endemic to the Central-S-Apennines from Umbria to Calabria and to Sicilia.

19. *Hydropsyche modesta* NAVAS, 1925

Material: 1 - 3.11.1990: 1 l, Lanese. 8 - 27.10.1971: 1 l, Mastrogiuseppe. 24 - 19.7.1992: 1 l, De Fanis. 27 - 19.7.1992: 2 l, De Fanis. 45 - 30.6.1979: 3 l/m², Cutrone.

Euryoecious species found in the Trigno and Biferno rivers. It is present in the Pre-Alps, Apennines and Sicilia. W-Palearctic distribution.

20. *Hydropsyche pellucidula* (CURTIS, 1834)

Material: 1 - 10.9.1990: 1 ♂; 3.11.1990: 1 p, 1 l; 7.1.1991: 1 l, Lanese. 2 - 30.6.1975: 35 ♂♂, 7 ♀♀, 1 l; 2.11.1975: 6 ♂♂, Mastrogiuseppe. 7 - 4.4.1972: 1 p♂, 1 p♀; 14.4.1975: 7 ♂♂, 4 ♀♀, 1 p♂, 1 p♀, Mastrogiuseppe. 8 - 6.4.1975: 9 ♂♂, 5 ♀♀, 3 p♂♂, 6 p♀♀, Mastrogiuseppe. 10 - 22.6.1975: 19 ♂♂, 1 ♀, Mastrogiuseppe. 11 - 10.4.1972: 3 ♂♂, 4 ♀♀, 1 p♂, 1 l, Mastrogiuseppe. 13 - 23.8.1990: 1 p, 1 l; 3.11.1990: 1 p♀, 1 l, Lanese. 14 - 29.6.1975: 11 ♂♂, Mastrogiuseppe. 15 - 3.3.1992: 1 ♂, De Fanis. 17 - 3.3.1992: 1 ♂, De Fanis; 13.4.1967: 1 ♂, 2p; 25.5.1967: 2 ♂♂; 31.5.1967: 3 ♂♂; 17.7.1967: 1 p♂, 1 l, Pangia. 19 - 25.8.1992: 2 ♂♂; 18.9.1992: 1 ♀, De Fanis. 22 - 23.8.1990: 1, Lanese. 24 - 25.8.1992: 1 ♂, 1 p♂, 27p, 46 l; 12.4.1993: 1 ♂, 1 p♂, 1 pr; 26.4.1993: 1 ♂; 3.5.1993: 1 ♀, De Fanis. 27 - 25.8.1992: 2 l, De Fanis. 33 - 28.9.1988: 4 l; 21.3.1989: 1 l, Salvatore. 34 - 12.10.1988: 1 l; 30.3.1988: 1 l, Salvatore. 35 - 9.9.1970: 1 ♂; 22.7.1971: 1, Barelli. 38 - 7.3.1989: 1; 24.6.1989: pr, l; 1.6.1989: 1 p♂, Salvatore. 39 - 29.1.1989: 1; 7.3.1989: 44 l, Salvatore. 40 - 7.3.1989: 1 l, Salvatore. 41 - 2.6.1979: 2 p♂♂, 5 p♀♀, 1 pr, 5 l, Salvatore. 42 - 8.4.1989: 4 pr, Salvatore. 43 - 2.6.1979: 2 p♂♂, 5 p♀♀, 1 pr, 2 l, Cutrone. 45 - 3.6.1979: 16 p/m², 15 pr/m², 59 l/m², Cutrone. 46 - 15.9.1979: 16 p♂♂, 21p, 16pr, 25 l, Cutrone. 49 - 9.4.1980: 42 l, Cutrone. 50 - 13.6.1967: 1 ♂, Pangia. 53 - 13.6.1967: 1 ♂, Pangia.

Euryoecious species widespread in the meta- hypo -rhithral zones of the Italian peninsula, it is widespread also in Molise. W-Palearctic distribution.

21. *Cheumatopsyche lepida* (PICTET, 1834)

Material: 2 - 30.6.1975: 9 ♂, 6 ♀, Mastrogiuseppe. 7 - 26.4.1972: 1 ♂; 7.7.1975: 1 ♂, 1 ♀, Mastrogiuseppe. 8 - 29.10.1971: 1; 2.9.1975: 1, Mastrogiuseppe. 10 - 22.4.1975: 1 ♂, Mastrogiuseppe. 16 - 22.5.1975: 1, Mastrogiuseppe. 17 - 13.7.1967: 1 ♀, Pangia. 19 - 25.8.1991: 1 ♀; 30.8.1991: 1 p♂; 25.8.1992: 3 l, De Fanis.

This euryoecious species is present in running water at low altitudes throughout Italy. Centralasiatic-Europeo-Mediterranean distribution.

Polycentropodidae

22. *Plectrocnemia alicatai* DE PIETRO, 1998

Material: 11 - 12/21.7.1980: 1 ♂, G.E. Langohor.

Sicilian specimens were first classified by De Pietro. It was then found in Umbria (CIANFICCONI et al. 2000) and Abruzzo (CIANFICCONI et al. 2002). The Molise finding (det. Botosaneanu) is the fourth in Italy.

Central- S -Apenninic Sicilian endemic.

23. *Plectrocnemia conspersa* (CURTIS, 1834)

Material: 12 - 19.7.1992: 2♂♂ (L); 12.4.1993: 1; 18.8.1993: fpv, De Fanis. 27 - 19.7.1992: pr, 2 l; 12.4.1993: 1, De Fanis. 28 - 19.7.1992: 10p, 5 l, De Fanis. 53 a - 25.4.1996: 1 ♂, Baccaro.

Found in the springs of the river Trigno. It is recorded in the crenal and hypocrenal zones of the Alps and Apennines. European distribution.

24. *Plectrocnemia geniculata* McLACHAN, 1871

Material: 21 - 6.11.1968: 1♀, Pangia. 25 - 9.3.1967: 1; 1.11.1968: 1♀, Pangia. 44- 30.6.1979: 4 l, Cutrone.

Crenophilous species. Since males of this species have not been collected, we are not able to classify the specimens from Molise as *P. geniculata corsicana* MOSELY, 1930 which is present in the Central-Northern Apennines and in the Orobie Alps (CIANFICCONI et al. 1993). Cenraleuropean distribution.

25. *Polycentropus mortoni* MOSELY, 1930

Material: 1 - 3.11.1990: p, Lanese. 2 - 23.6.1975: 2♂♂, Mastrogiuseppe. 8 - 6.4.1975: 1, Mastrogiuseppe. 10 - 22.6.1975: 1♂, Mastrogiuseppe. 12 - 10.6.1993: 1♀, De Fanis. 19 - 19.7.1992: 4p, De Fanis. 24 - 30.7.1991: 1p; 17.9.1992: 1p♀, 1; 25.8.1992: 2p, 2 l, De Fanis. 28 - 28.8.1991: 1; 30.8.1991: 1♂, 1; 19.7.1992: 1p♂, De Fanis. 29 b - 11.5.1991: 1♂; 13.5.1993: 33 l (PANNUNZIO et al. 1999) 35 - 15.8.1969: 1; 22.7.1971: 2♂♂, Zarelli. 37 - 9.9.1988: 1♂, Salvatore. 38 - 16.7.1988: 5 l, Salvatore. 39 - 9.9.1988: 1♂; 30.3.1989: 1, Salvatore.

Present in watercourses of the Apennines (from Toscana to Calabria), Corsica, Sardegna and Sicilia, it has been found in Molise in running water and in the Zittola marsh. Tyrrhenian endemic.

26. *Cyrnus trimaculatus* (CURTIS, 1834)

Material: 30a - 7.6.2003: 1♀, leg. Rausch (MALICKY 2005).

Found in the Vandra stream (det. Malicky), it inhabits lentic waters or slowly running waters of the Pre-Alps and Central-Apennines. Centralasiatic-European distribution.

Psychomyiidae

27. *Psychomyia pusilla* (FABRICIUS, 1781)

Material: 14 - 29.6.1965: 2♂♂, Mastrogiuseppe. 35 - 22.7.1971: 1♂, 1♀; 2.11.1970: 1♂, Zarelli.

Present in shallow waters of the Peninsula and Sardegna. W-Palearctic distribution.

28. *Lype reducta* (HAGEN, 1868)

Material: 2 - 3.9.1975: 1♂, Mastrogiuseppe.

Recorded in the Apennines, Sardegna and Sicilia, mainly in spring-brooks. Europeo-Mediterranean distribution.

29. *Tinodes antonioi* BOTOSANEANU & VIGANÒ, 1974

Material: 5 - 2.9.1967: 1♂, Pangia. 35 - 15.8.1969: 1♂, Zarelli.

Found in the rhithral zone of the Pre-Alps and Apennines (from Lombardia to Calabria) it has been recorded in Slovenia (KRUSNIK & URBANIC 2002) and in the French Maritime Alps (BOTOSANEANU & GIUDICELLI 2003). Alpino-Apenninic endemic.

30. *Tinodes dives consilioi* BOTOSANEANU, 1980

Material: 52 - 30.7.1967: 8♂♂, 1♀; 5.8.1968: 6♂♂, 2♀♀, Pangia; 10.9.1971: 1♀, Zarelli. 54 - 5.4.1967: 1♂; 30.7.1967: 1♀; 28.9.1970: 1♂, Zarelli.

Found in spring-brooks of the river Biferno. It is endemic to the Apennines and French Maritime Alps (BOTOSANEANU & GIUDICELLI 2003). W-Alpino-Apenninic endemic.

31. *Tinodes maclachlani* KIMMINS, 1966

Material: 15 - 19.7.1992: 1♀; 25.8.1992: 1♀, De Fanis.

Found in the Trigno spring on walls covered with Bryophytes and rotting leaves. Present throughout the Italian peninsula in hygropetric habitats on the plains and in the mountains. W-European distribution.

32. *Tinodes waeneri* (LINNAEUS, 1758)

Material: 56 - 7.9.1970: 1♂, Zarelli.

Frequent in lentic or slowly running waters of the Peninsula and islands. European and N-African distribution.

P h r y g a n e i d a e

33. *Agrypnia varia* (FABRICIUS, 1793)

Material: 35 - 15.8.1969: 1♀, Zarelli.

It can be seen in ponds, peat-bogs and agricultural lakes in the Apennines. Centralasiatic-European distribution.

B r a c h y c e n t r i d a e

34. *Micrasema minimum* McLACHLAN, 1876

Material: 35 - 15.8.1969: 1; 22.7.1971: 1, Zarelli. 44 - 26.4.1970: 1; 27.4.1971: 1, Zarelli. 50 - 27.5.1967: 3♂♂, 3♀♀, Pangia. 54 - 4.4.1967: 3♂♂, Pangia; 28.7.1967: 1, Zarelli.

Found in Italy in lotic waters from Lombardia to Molise. S-European distribution.

35. *Micrasema morosum* (MCLACHLAN, 1868)

Material: 52 - 11.6.1996: 1 ♂, Baccaro.

Present in the Italian Peninsula in crenal and rhithral zones with mosses. Central-S-European distribution.

Limnephilidae

***Drusus* sp.**

Material: 4 - 14.3.1989: 3 l. Iannaccio.

Finding of great interest because there are two endemic species of *Drusus* in Central Italy found only in springs. The absence of male specimens made classification impossible.

36. *Limnephilus auricula* CURTIS, 1834

Material: 29 b - 11.5.1991: 11 ♂ ♂, 7 ♀ ♀ (PANNUNZIO et al. 1999).

In Italy it is a sporadic finding in ponds at altitudes above 1000 m in the central Apennines. European distribution.

37. *Limnephilus bipunctatus* CURTIS, 1834

Material: 3 - 4.6.1988: 1 ♀; 29.5.1989: 3 ♂ ♂, 1 ♀, Iannaccio. 15 - 21.4.1992: 1 ♀, De Fanis. 29 b - 10.3.1990: 4 l; 11.5.1991: 1 ♂ (PANNUNZIO et al., 1999). 36 - 2.5.1989: 1 ♂; 30.6.1989: 1 ♂, Iannaccio.

In Italy it is a typical inhabitant of mountain pools of the Central Apennines. In Molise, it is also found in the Zittola marsh. European distribution.

38. *Limnephilus flavicornis* MACLACHLAN, 1865

Material: 3 - 10.6.1988: 1 ♂, Iannaccio. 5 - 5.6.1989: 1 ♂, Iannaccio.

It is widespread in the stagnant waters of the Peninsula. Palearctic distribution.

39. *Limnephilus helveticus* SCHMID, 1965

Material: 24 - 12.4.1993: 1p ♂, De Fanis. 29 - 22.6.1969: 1 ♀, Pangia.

It can be seen in limnocrenic waters rich in submerged vegetation. It is present in the Alps and Apennines (from Umbria to Puglia).

S-European distribution.

40. *Limnephilus hirsutus* (PICTET, 1834)

Material: 29 b - 18.6.1992: 1 ♀ (PANNUNZIO et al. 1999).

It is found infrequently in slowly running waters of the Peninsula and Sicilia. Euroanatolian distribution.

41. *Limnephilus ignavus* MACLACHLAN, 1865

Material: **29 b** - 19.10.1991: 1 ♀; 18. 6.1992: 2 ♂♂ (PANNUNZIO et al. 1999).

Infrequent in Italy, it has been found in rheolimnocrenous springs in the Abruzzo region, in the Zittola marsh and in Sicilia. W-Palearctic distribution.

42. *Limnephilus italicus* (PICTET, 1934)

Material: **3** - 6.6.1988: 1 ♂, Iannaccio. **20** - 29.5.1989: 1 ♀, Pangia.

Rare in the Italian Peninsula. S-European distribution.

43. *Limnephilus lunatus* CURTIS, 1834

Material: **12** - 1.11.1992: 1 ♂, 3 ♀♀, De Fanis. **29 b** - 4.9.1992: 1 ♀; 13.V.1993: 1 ♀ (PANNUNZIO et al. 1999).

It is widespread in Italy in lentic waters, in slowly running water and in limnocrenous springs. W-Palearctic distribution.

44. *Limnephilus rhombicus* (LINNAEUS, 1758)

Material: **15** - 5.10.1991: 1 ♀; 3.4.1992: 1 ♂, De Fanis.

It is a lenitophilous species present also in limnocrenous springs. Holarctic distribution.

45. *Limnephilus sparsus* CURTIS, 1834

Material: **29b** - 1.6.1991: 1 ♀ (PANNUNZIO et al. 1999).

The only finding in Molise is from the Zittola marsh. Present in the Peninsula and Sicilia especially in stagnant waters in mountains. Palearctic distribution.

46. *Limnephilus vittatus* (FABRICIUS, 1758)

Material: **29 b** - 10.3.1990: 5 l (PANNUNZIO et al. 1999). **36** - 5.6.1989: 1 ♀, Iannacio.

It is found in marshes, mountain pools, and temporary waters in mountain zones of the Italian peninsula and Sicilia. Palearctic distribution.

47. *Grammotaulius nigropunctatus* (RETZIUS, 1783)

Material: **5** - 4.5.1988: p, l; 1.6.1988: fpv; 14.3.1989: l; 24.4.1989: l, Iannaccio. **29 b** - 7.6.1990: 1 l; 11.5.1991: 2 l (PANNUNZIO et al. 1999). **55** - 16.4.1962: 1 ♀, Ruffo.

It can be seen in marshes in the Apennine high plains. Palearctic distribution.

48. *Potamophylax cingulatus gambaricus* MALICKY, 1971

Material: 6 - 4.4.1989: 1; 24.4.1989: 1, Iannaccio. 12 - 5.10.1991: 1; 30.7.1991: 1; 17.2.1992: 1; 4.2.1992: fpv; 19.7.1992: 5 l; 5.10.1991: 80 fpv; 14.9.1992: 2 l; 18.9.1992: 2p♂♂, 2p♀♀, 8 l, De Fanis. 26 - 15.5.1989: 1, Iannaccio. 27 - 21.4.1982: 1, De Fanis. 28 - 28.7.1991: 2 l, De Fanis. 30 - 15.5.1989: 1, Iannaccio. 31 - 18.4.1989: 25♂♂; 24.4.1989: 10 l; 29.5.1989: 18 p, Salvatore. 34 - 30.3.1989: 1; 1.4.1989: 1; 24.4.1989: 1, Salvatore. 37 - 9.9.1988: 1p♂, Salvatore. 42 - 8.4.1980: 35 l, Cutrone. 52 - 23.8.1969: 1; 4.10.1970: 1♀, Zarelli. 53 - 10.10.1967: 1♂, Pangia. 53 a - 18.2.1996: 1♀, Baccaro. 54 - 11.8.1970: 1♂; 28.9.1970: 1♂, 1♀, 28.9.1971: 11♂♂, 8♀♀, Zarelli. 55 - 11.8.1969: 1, Zarelli. 58 - 19.8.1988: 3p♂♂, 1p♀, Salvatore.

Endemic to north central Apennines, it is widespread in 16 rhithral sites in Molise. Apenninic Sicilian endemic.

49. *Halesus appenninus* MORETTI & SPINELLI, 1981

Material: 3 - 14.10.1988: 1♂, 2♀♀, Iannaccio. 9 - 24.4.1989: 1, Iannaccio. 12 - 28.7.1991: 1 l; 14.2.1992: 1 l; 19.7.1992: 4 l, De Fanis. 15 - 5.10.1991: 1p♂; 17.1.1992: 1 l; 21.4.1992: 1 l; 12.4.1993: 10 l, De Fanis. 24 - 30.7.1991: 2 l, De Fanis. 26 - 15.5.1989: 10 l, Iannaccio. 27 - 5.10.1991: 1 l; 21.4.1992: 24 l; 19.7.1992: 12 l, De Fanis. 28 - 28.7.1991: 12 l; 30.8.1991: 1p♀, 1 l, De Fanis. 29 b - 10.3.1990: 1 l; 13.5.1993: 1 l (PANNUNZIO et al. 1999). 30 - 15.5.1989: 1, Iannaccio. 35 - 15.8.1969: 1, Zarelli. 44 - 26.4.1970: 1; 26.4.1971: 1, Zarelli. 54 - 28.7.1969: 1; 19.11.1971: 1♂, Zarelli.

It can be seen in hypocrenal and epirhithral zones of the Apennines (from Emilia Romagna to Basilicata) and Sicilia. Apenninic Sicilian endemic.

50. *Melampophylax vestinorum* MORETTI, 1991

Material: 54 - 12.11.1991: 1♂, Zarelli.

Described using Abruzzo specimens (MORETTI 1991) it was later collected in Lazio, Molise and Calabria (VALLE 2001). Central S-Apenninic endemic. (Fig. 4).

51. *Enoicyla costae* MACLACHLAN, 1876

Material: 11 - 22.5.1975: 1♂, Mastroguseppe.

Recorded in Southern Italy and Sicilia; the Molise finding is the northernmost. The female of this species is apterous and the larva is not aquatic. It has a transitory distribution as it has been found also in the Balkan Peninsula. W-Mediterranean distribution.

52. *Stenophylax mitis* MACLACHLAN, 1875

Material: 6 - 26.6.1988: 1♀; 29.5.1989: 1♂, Iannaccio. 37 - 9.9.1988: 1p♂, 1pr, Salvatore.

Cavernicolous species, it is found in epigean habitats. Mediterranean distribution.

53. *Stenophylax mucronatus* MACLACHLAN, 1880

Material: 59 - 18.7.1971: 1♂, 1♀, A. Antonelli. (MORETTI & CIANFICCONI 1985).

The only finding in Molise in the Pozzo della Neve cave. It is found in hypogean cavities in Italy, from Toscana to Calabria. S-European distribution.

54. *Micropterna fissa* (MACLACHLAN, 1875)

Material: 17 - 9.5.1969: 2♂♂, Pangia.

Only found in the Tona stream. In Italy it is recorded in caves in Lombardia, Veneto, the Apennines from Toscana to Campania and Sardegna with high numbers of specimens. European distribution.

55. *Micropterna malaspina* SCHMID, 1957

Material: 12 - 25.8.1992: 1♂; 12.4.1992: fpv; 21.4.1992: 1, De Fanis.

Found in 3 caves in Puglia its distribution extends to Molise. Recorded in Anatolia, Greece, Crete, Bulgaria and Israel, it has an E-Mediterranean distribution.

56. *Micropterna nycterobia* MACLACHLAN, 1875

Material: 3 - 4.6.1988: 1♂; 5.6.1989: 1♂; 2.10.1989: 1, Iannaccio. 55 - 13.8.1969: 1♀, Zarelli.

The specimens were collected in spring waters. It is recorded in Italian caves from Piemonte to Campania. European distribution.

57. *Micropterna sequax* MACLACHLAN, 1875

Material: 20 - 4.5.1988: 1; 2.6.1989: 2♂♂, Iannaccio.

Found in the Salcitaro stream at 850 m a.s.l. It is recorded in Italian caves from Piemonte to Campania. European distribution.

58. *Micropterna testacea* (GMELIN, 1789)

Material: 17 - 10.6.1967: 2♂♂, Pangia. 18 - 7.4.1977: 1♂, Pangia. 32 - 13.6.1989: 1♂, Iannaccio. 42 - 8.4.1980: 1p♀, Cutrone.

Found in tributaries of the rivers Fortore and Volturno, it is a subtroglophilous species collected in Italian caves from Piemonte to Campania. Central-S-European distribution.

59. *Mesophylax aspersus* (RAMBUR, 1842)

Material: 7 - 17-3.1991 fpv, Lanese. 17 - 12.3.1967: p, 1; 13.4.1977: 1♀, 2p♂♂; 17.7.1967: 1p♂, Pangia. 18 - 13.3.1967: p, Pangia. 24 - 30.7.1991: 1, De Fanis. 42 - 8.4.1980: 4 l, Cutrone.

Found in the streams Cigno, Tona, Tappino and the river Trigno as aquatic stages and adults. It is a troglophilous species, frequently found in Italian caves. The larvae live in temporary waters. Europeo-Mediterranean distribution.

60. *Allogamus antennatus ausoniae* MORETTI, 1991

Material: 12 - 28.7-30.8-5.10.1991: 1; 17.1-14.2.1992: 1, De Fanis. 15 - 21.4.1992: 12 l; 1.11.1992: 3 ♀ ♀ De Fanis. 23 - 15.5.1989: 1; 20.6.1989: 1, Iannaccio. 27 - 5.10.1991: 20p♂♂, 16p♀♀, 1; 21.4.1992: 33 l; 17.7.1992: 18 l; 25.8.1992: 1 l; 12.4.1992: 22 l, De Fanis. 28 - 30.8.1991: 1; 19.7.1992: 40 l, De Fanis. 33 - 28.9.1988: 1p♂, Salvatore. 44 - 26.4.1970: 1, Zarelli. 52 - 15.9.1968: 1p♂, 1; 11.10.1968: 1 ♀, Pangia. 52 a - 24.10.1995: 2♂♂, 14♀♀, fpv; 30.10.1995: 8♂♂, 16♀♀; 9.4.1996: fpv, Baccaro. 53 a - 24.10.1995: 32♂♂ 60♀♀; 30.10.1995: 14♂♂ 23♀♀; 54 - 5.10.1970: 1♀; 29.9.1971: 2♀♀; 4.10.1971: 1♂, Zarelli. 58 - 14.9.1988: 1p♂, Salvatore.

The specimens of this taxon were collected in many sampling sites in crenal and epirhithral zones. Endemic to the central Apennines, it extends to Molise. Central-S-Apenninic endemic.

61. *Chaetopteryx gessneri* MACLACHLAN, 1876

Material: 3 - 19.10.1988: 1♂, Iannaccio. 28 - 29.10.1991: 1♂, 1♀, De Fanis. 52 - 11.10.1968: 1♂, 1♀, Iannaccio. 53 a - 24.10.1995: 7♂♂, 3♀♀; 7.1.1996: 4♂♂, 3♀♀; Baccaro.

This crenobiont inhabits rheocrenous springs including diverted springs (Sorgente Pietre Cadute) Emergence occurs in autumn to winter. Alpino-Apenninic endemic.

Goeridae

62. *Silo mediterraneus* MACLACHLAN, 1884

Material: 12 - 21.4.1992: p; 28.4.1992: 4♂♂; 30.4.1992: 2♂♂; 5.5.1992: 2♂♂, 2♀♀; 16.5.1992: 1♀; 25.8.1992: 4p; 1.9.1992: 15 l; 12.4.1992: 16p; 26.4.1993: 1♂; 3.5.1993: 2♂♂, 3♀♀, De Fanis. 15 - 23.4.1992: 1♂; 25.8.1992: 11p; 18.8.1993: 1, De Fanis. 29 b - 13.5.1993: 1fpv, 1p♂; 21.5.1993: 7♂♂, 2♀♀, (PANNUNZIO et al. 1999). 31 - 24.4.1989: 1; 5.8.1968: 3♂♂, Salvatore. 52 - 30.8.1067: 20♂♂, 1♀; 5.8.1968: 3♂♂, Pangia. 52 a - 10.9.1995: 1; 18.2.1996: 17 fpv; 9.4.1996: fpv; 25.4.1996: 3♂♂, 17.6.1996: 2♂♂, Baccaro. 53 - 5.8.1968: 29♂♂, 1♀; 31.8.1967: 26♂♂, 3♀♀, Pangia; 23.7.1969: 1; 5.10.1970: 8♂♂; 10.9.1971: 12♀♀, Zarelli. 53 a - 18.2.1996: 1, 1♂; 25.4.1996: 2♀♀, Baccaro.

214 specimens were collected in spring brooks in 8 sites between 480 and 1200 m a.s.l. It prefers hypocrenal and epirhithral zones. Endemic of the Central Apennines and Sardegna. Tyrrhenian endemic.

Lepidostomatidae

63. *Lepidostoma hirtum* (FABRICIUS, 1775)

Material: 9 - 24.4.1989: 1, Iannaccio.

The only finding was in the Sangro river. It inhabits running water with mosses, algae and submerged vegetation in Italy from the Alps to Calabria. Sibero-European distribution.

64. *Crunoecia irrorata* (CURTIS, 1834)

Material: 53 - 31.8.1967: 1♂, Pangia.

Found in a diverted spring (S. Maria dei Rivoli). This crenobiont inhabits small springs with hygropetric habitats in the Peninsula and Sicilia. European distribution.

Leptoceridae

65. *Athritpsodes morettii* CIANFICCONI & SALERNO, 2000

Material: 2 - 24.8.1975: 3♂♂, 5♀♀, Mastroguseppe. 8 - 20.6.1975: 2♂♂, 3♀♀, Mastroguseppe. 10 - 22.6.1975: 3♂♂, 5♀♀, Mastroguseppe. 16 - 7.6.1975: 1♀, Mastroguseppe. 17 - 21.5.1968: 1♂, 1♀, Pangia. 41 - 11.9.1979: 1♀, Cutrone.

These specimens, previously attributed to *Athritpsodes bilineatus*, after revision (Cianficconi, Salerno), appear to belong to the new species. It is found in the Apennines (from Toscana to Calabria) and Sicilia. Apenninic Sicilian endemic.

66. *Mystacides azurea* (LINNAEUS, 1761)

Material: 47 - 31.8.1977: 1♂, Pangia.

Found in a tributary of Fosso Callora, it is widespread in stagnant and slowly running waters in the Peninsula. Palearctic distribution.

67. *Leptocerus tineiformis* CURTIS, 1834

Material: 2 - 30.6.1975: 1♂, Mastroguseppe.

Only found in the Cigno stream. It is a marsh species found in mountain pools and agricultural lakes in the Peninsula and Sicilia. Euroanatolian distribution.

Sericostomatidae

68. *Sericostoma italicum* MORETTI, 1978

Material: 12 - 28.7.1991: 1; 5.10.1991: 1; 17.1.1992: 1; 19.7.1992: 1♂; 12.4.1993: 1, De Fanis. 15 - 17.1.1992: 12 l; 21.4.1992: 2 l, De Fanis. 25 - 6.9.1967: 1, Pangia. 28 - 28. 17.1991: 1; 19.7.1992: 3p, De Fanis. 29 b - 13.5.1993: 1 fpv, 1p♂; 21.5.1993: 7♂♂, 2♀♀ (PANNUNZIO et al. 1999). 44 - 28.9.1970: 1♂, Zarelli. 52 - 19.5.1968: 1♂, Pangia. 52 a - 17.6.1996: 1♂, 1♀, Baccaro. 53 - 5.8.1968: 1♀, Zarelli. 53 a - 11.6.1996: 2♂♂, 7♀♀, 17.6.1996: 8♂♂, 3♀♀, Baccaro. 54 - 23.7.1969: 1; 26.4.1970: 1; 28.9.1971: 2♀♀, Zarelli. 56 - 28.7.1969: pr, 1, Zarelli.

Found in 12 sites in hypocrenal and rhithral zones with sandy substrates, located from 460 to 1200 m a.s.l. it is well represented in Molise. Endemic to central southern Apennines, from Toscana to Puglia. Central-S-Apenninic endemic.

Odontoceridae

69. *Odontocerus albicorne* (SCOPOLI, 1769)

Material: 8 - 29.5.1991: 2♂♂; 17.6.1991: 6♂♂, 2♀♀, Lanese. 15 - 21.5.1992: 3♂♂, 9 l; 25.8.1992: 3 fpv, De Fanis 27 - 25.8.1992: 5 l, fpv De Fanis. 28 - 30.8.1991: 2 l; 19.7.1992: 2 l, De Fanis. 31 - 24.4.1989: 2p♂♂, p, l; 29.5.1989: 7♂♂, 25p, Salvatore. 35 - 18.4.1969: p, l; 27.7.1971: 1, Zarelli. 39 - 9.9.1988: 1p♂; 30.3.1989: 11 l/m², Salvatore. 54 - 28.9.1969: 1, Zarelli.

Collected in 8 sites in the Trigno, Biferno and Volturno basins, it inhabits the running waters of the hypocrenal, epirhithral and hyporhithral zones of the Italian Peninsula and Sicilia. European distribution.

Discussion

During the research on 253 samplings, 1052 adults (652 ♂♂, 400 ♀♀) and 1613 aquatic stages were collected. 69 taxa (64 species, 5 subspecies) were identified. They represent respectively 15.4 % of the species and 15.6 % of the subspecies of the Italian Trichopteran fauna (416 species, 32 subspecies) and belong to 35 genera and 15 families of the 93 genera and 20 families known in Italy.

The families with the highest number of species are Rhyacophilidae (5 species and 2 subspecies of *Rhyacophila*, equal to 14.2 % of the species and 50 % of the subspecies present in Italy), Limnephilidae with 11 species of *Limnephilus* (equal to 39.3 % of the species of the Peninsula), 5 species of *Micropterna* (equal to 62 % of the species of the Peninsula) and Hydroptilidae with 4 species of *Hydroptila* (equal to 18.18 % of the species present in Italy).

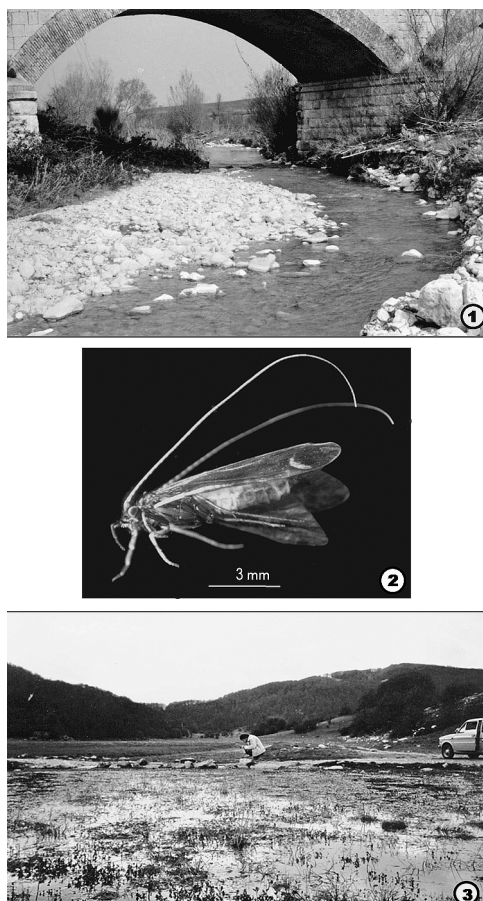


Fig. 2: (1) Site 8: T. Cigno Ponte Rotello, 168 m, winter view (12-1-1991). Hyporhithral zone inhabited by: *Rhyacophila rougemonti*, *Hydropsyche pellucidula*, *Cheumatopsyche lepida*, *Polycentropus mortoni*, *Athripsodes morettii*, *Mystacodes azurea*. (2) *Athripsodes morettii* ♂ endemic to the Apennines and Sicilia (photo C. Corallini). (3) Site 36: Lago Civitanova spring view (24-4-1989). Mountain pool (1310 m) inhabited by: *Limnephilus bipunctatus* and *L. vittatus*.

The ecological balance shows, as well as euryoecious species in lotic waters, the presence of madicolous species (*Tinodes maclachlani*), crenal species (*Catagapetus nigrans*, *Plectrocnemia geniculata*, *Chaetopteryx gessneri*, *Crunoecia irrorata*), and epirhithral and hyporhithral biozones which provide the populations richest in species (Fig. 2/1, 2/2). The

lentic species include, as well as *Tinodes waeneri*, *Mystacides azurea*, *Agrypnia varia* in the bends of the rivers, various species of *Limnephilus* in the Zittola marsh (*L. auricula*, *L. bipunctatus*, *L. hirsutus*, *L. ignavus*, *L. lunatus*, *L. sparsus*, *L. vittatus*) and in the mountain pools (*L. bipunctatus*, *L. flavicornis*, *L. vittatus*) (Fig. 2/3). *Stenophylax mucronatus* was found in the cave.

Table 1 shows the taxa in the basins, mountain pools and hypogean cavity. For each biotope, the species are listed with the number of sites, specimens, samplings, total number of basins in which the species were found, altitude and chorotypes.

The Biferno basin has the highest number of species (40) and the Trigno the highest number of specimens (1059). However, in these two basins there were more samplings and more sites studied.

The most widespread species include: *Potamophylax cingulatus gambaricus* (5 basins), *Rhyacophila dorsalis acutidens*, *R. rougemonti*, *Hydropsyche pellucidula*, *Polycentropus mortoni*, *Halesus appenninus*, *Silo mediterraneus*, *Sericostoma italicum* (4 basins). 33 species were found only in one basin or only in one site: 4 in the Sangro; 7 in the Trigno (including *Hydroptila cognata*, *H. tigurina* collected with light traps); 17 in the Biferno (including *Rhyacophila hartigi*, *Catagapetus nigrans*, *Plectrocnemia alicatai*, *Tinodes dives consiglio*, *Melampophyax vestinorum*, endemic to the Italian fauna, *Hydroptila martini*, collected with light traps, *Enoycila costae*, rare in Italy); 3 in the Volturno (including *Rhyacophila vallei*, *Hydropsyche klefbecki*, both endemic to the Italian fauna); and 2 in the Fortore.

The species with the highest number of specimens were: *Hydropsyche pellucidula* (519), *Allogamus antennatus ausoniae* (344), *Rhyacophila dorsalis acutidens* (311). *Potamophylax cingulatus gambaricus* (233), and *Rhyacophila rougemonti* (201).

The altitudes of the sampling sites are from 32 to 1430 m a.s.l. The subdivision into 5 classes of 300 m (Fig. 3) shows that the highest percentage of species is between 300 and 900 m. *Grammotaulius nigropunctatus*, *Micropterna nycterobia* and 6 species of *Limnephilus* were found at altitudes above 1000 m, *Orthotrichia angustella*, *Hydroptila martini*, *Lype reducta*, *Leptocerus tineiformis* at altitudes around 32-34 m, *Rhyacophila foliacea*, *R. rougemonti*, *Hydropsyche pellucidula*, *Polycentropus mortoni* from 32 to 1000 m.

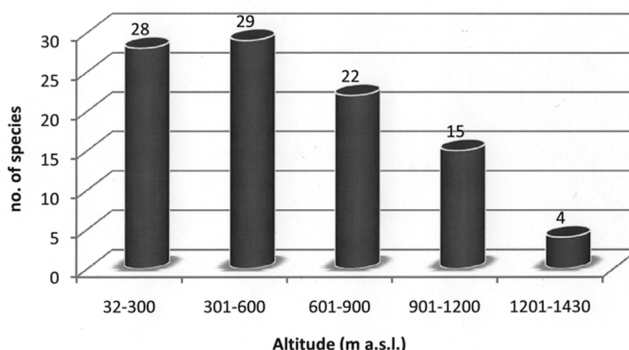


Fig. 3: Percentage of Trichopteran species subdivided into 5 altitudinal ranges of 300 m.

The zoogeographical balance (Fig. 4) shows a predominance of species with European distribution (39 %). 26 % are species with wide distribution (Holarctic, Palearctic, W-Paleartic, Centralasiatic-European, Centralasiatic-European-Mediterranean, Europeo-Mediterranean).

anean, Sibero-European) and 6 % are species with Mediterranean distribution. 15 species and 5 subspecies (29 %) can be considered endemic to the Italian fauna. It is noteworthy that the endemic *Rhyacophila* present in Molise (4 species and 2 subspecies) constitute 57 % of the species and 50 % of the subspecies of *Rhyacophila* endemic to Italy (CIANFICCONI et al. 2008).

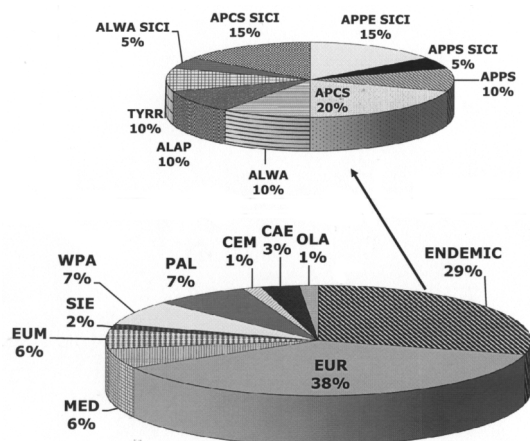


Fig. 4: Percentage of the geographical distribution of the Molise Trichopteran species and subspecies, according to the main chorotypes (VIGNA TAGLIANTI et al. 1999). OLA = Holarctic, PAL=Palearctic, WPA=W-Palearctic, SIE=Sibero-European, CAE=Centralasiatic-European, CAM=Centralasiatic-Mediterranean, EUM=Europeo-Mediterranean, EUR=European, MED=Mediterranean, Endemic: ALAP=Alpino-Apenninic, ALWA=W-Alpino-Apenninic, ALWA SICI=W-Alpino-Apenninic-Sicilian, APPE SICI =Apenninic-Sicilian, APCS=Central-S-Apenninic, APCS SICI=Central-S-Apenninic-Sicilian, APPS=S-Apenninic, APPS SICI=S-Apenninic-Sicilian, TYRR=Tyrrhenian.

The endemics to the S-Apennines include *Rhyacophila dorsalis pantinii* (Fig. 5/1) with distribution limited to Molise and Campania, *R. vallei* to Molise, Campania, Basilicata and Calabria (Fig. 5/2), *R. hartigi* to Molise, Basilicata, Calabria and Sicilia (Fig.5/3). The endemics to the Central S-Apennines include *Melampophylax vestinorum* with distribution limited to Abruzzo, Molise, Lazio and Calabria (Fig. 6), *Hydropsyche klefbecki* to Umbria, Lazio, Molise, Calabria, Sicilia.

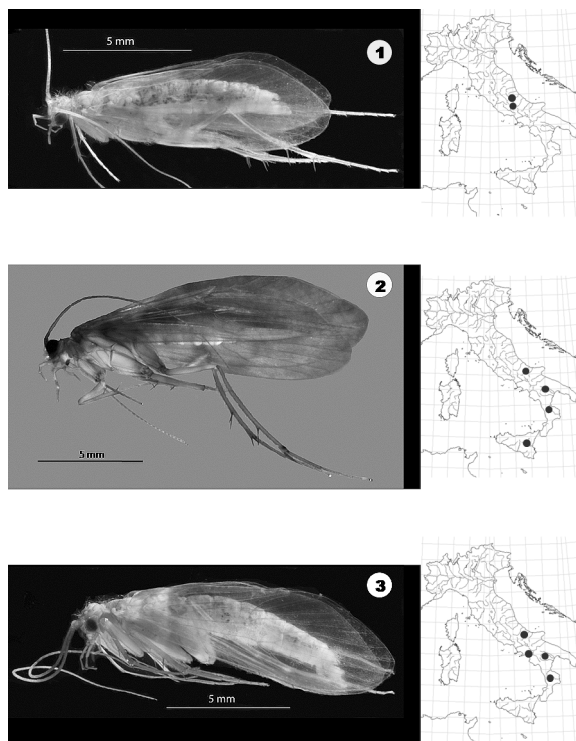
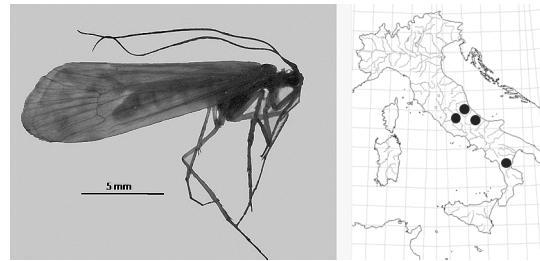


Fig. 5: Three *Rhyacophila* species endemic to the Southern Apennines: (1) *R. dorsalis pantinii* ♂. F. Biferno, Castropignano, 200 m (photo O. Lodovici, Museo Sc. Naturali "Caffi" Bergamo). (2) *R. vallei* ♂ F. Trigno, Bagnoli del Trigno, 470 m (photo O. Lodovici, Museo Sc. Naturali "Caffi" Bergamo). (3) *R. hartigi* ♂ T. Cigno, Montorio nei Frantani, 290 m (photo F. Scoccia, Dipartimento di Biologia Cellulare e Ambientale, Perugia).

Fig. 6: *Melampophylax vestinorum* ♂, endemic to Central Southern Apennines. Rio Freddo, Boiano, 490 m (photo F. Scoccia, Dipartimento di Biologia Cellulare e Ambientale, Perugia).



In conclusion, on the basis of this data the Trichopteran fauna of the Molise region is of great systematic, ecological and zoogeographical interest. The recent use of light traps by researchers has permitted more faunistic findings, especially of the genera *Hydroptila* and *Rhyacophila*.

This paper provides useful information for future studies of Trichoptera in Molise. It is important to ascertain the taxonomy of the *Drusus* specimens found in the Sangro basin at a specific level, to extend research using light traps and to carry out more samplings near the mouth of the rivers Trigno and Biferno.

Acknowledgements

We would like to thank Omar Lodovici and Francesca Scoccia for the photos of the adults of endemic Trichoptera species.

Zusammenfassung

Erstmals wird eine zusammenfassende Liste der Trichopteren der Region Molise publiziert. Sie ist Ergebnis der Freilandarbeit zwischen 1962 und 2005 an 68 Stellen (64 lotischen, 3 lentischen und einer unterirdischen). Die lotischen Stellen umfassen zehn Quellen und 54 Bäche, die lentischen ein Moor und zwei Gebirgstümpel. 64 Arten und 5 Unterarten von 15 Familien wurden gefunden. 57 Arten wurden nur in Fließgewässern, elf nur in stehenden Gewässern, und nur eine *Stenophylax*-Art wurde in einer Höhle gefunden. 15 Arten und fünf Unterarten sind in Italien endemisch, drei von ihnen (darunter *Rhyacophila dorsalis pantinii*, nur in Molise und Campania [Fluss Volturno]) sind auf die südlichen Apenninen beschränkt. Die seltene Art *Hydroptila tigurina* wurde in Lichtfallen am Fluss Trigno gefunden.

Résumé

Il s'agit de la première liste de Trichoptères provenant de cette région. C'est le fruit d'une recherche réalisée de 1962 à 2005 dans 68 sites d'échantillonnage dont 64 lotiques, 3 lentiques, 1 hypogée. Les sites d'échantillonnage lotique comprennent 10 sources et 54 cours d'eau. Les sites lentiques comprennent 1 marécage et 2 lacs de montagne. 64 espèces et 5 sous-espèces appartenant à 15 familles ont été collectées. 57 espèces de différentes catégories écologiques se trouvent uniquement dans les biotopes lotiques, 11 uniquement dans des biotopes lentiques et 1 espèce de *Stenophylax* dans une cavité hypogée. Les espèces appartiennent à plusieurs catégories chorologiques. 15 espèces et 5 sous-espèces sont endémiques à la faune italienne dont 3 sont limitées aux régions des Apennins méridionaux, y compris *Rhyacophila dorsalis pantinii* VALLE, 2001 qui est endémique uniquement au Molise et à la Campanie (Fleuve Volturno). Il convient de souligner la présence de *Hydroptila tigurina* RIS, 1894 collectée par des trappes de lumières dans le fleuve Trigno car il s'agit d'une espèce rare en Italie.

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Tab. 1: List of taxa found in Molise with number of sites (= si), specimens (= sp), samplings (= sa), altitude m a.s.l., chorotypes, *= species endemic to the Italian fauna.

Taxa		Basins															Total basins	Mountain pools			Hypogean cavity			Total sites	Total specimens	Total samplings	Altitude m a.s.l.	Chorotypes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Taxa	Basins															Total basins	Mountain pools			Hypogean cavity			Total sites	Total specimens	Total samplings	Altitude m a.s.l.	Chorotypes	
	Sangro			Trigno			Biferno			Fortore			Volturno				2			1								
	si	sp	sa	si	sp	sa	si	sp	sa	si	sp	sa	si	sp	sa		si	sp	sa	si	sp	sa						
Total sampling sites	6			11			23			11			13				2			1								
PHRYGANEIDAE																1							1	1	1	200	CAE	
33 <i>Agrypnia varia</i>								1	1	1																		
BRACHYCENTRIDAE																1												
34 <i>Micrasema minimum</i>								4	14	7													4	14	7	200-490	SEU	
35 <i>M. morosum</i>								1	1	1													1	1	1	480	EUR	
LIMNEPHILIDAE																												
<i>Drusus</i> sp.	1	3	1													1							1	1	1			
36 <i>Limnephilus auricula</i>	1	18	1													1							1	18	1	820	EUR	
37 <i>L. bipunctatus</i>	2	10	4	1	1	1										2	1	2	2				4	13	7	820-1130	EUR	
38 <i>L. flavicornis</i>	1	1	1													1	1	1	1				2	2	2	1010	PAL	
39 <i>L. helveticus</i>				1	1	1							1	1	1	2							2	2	2	570-600	SEU	
40 <i>L. hirsutus</i>	1	1	1													1							1	1	1	820	EUR	
41 <i>L. ignavus</i>	1	3	2													1							1	3	2	820	WPA	
42 <i>L. italicus</i>	1	1	1	1	1	1										2							2	2	2	850-1040	SEU	
43 <i>L. lunatus</i>	1	2	2	1	4	1										3							2	6	3	820-1200	WPA	
44 <i>L. rhombicus</i>				1	2	2										1							2	2	2	1100	OLA	
45 <i>L. sparsus</i>	1	1	1													1							1	1	1	820	PAL	
46 <i>L. vittatus</i>	1	5	1													1	1	1	1				2	6	2	820-1130	PAL	
47 <i>Grammotaulius nigropunctatus</i>	1	3	2				1	1	1							2	1	4	4				3	8	7	820-1430	PAL	
48 <i>Potamophylax cingulatus gambaricus</i> *	1	2	2	4	107	11	6	31	19	1	35	1	4	58	8	5							16	233	41	480-1260	APPE SICI	
49 <i>Halesus appenninus</i> *	3	6	4	6	82	14	3	5	5				1	1	1	4							13	94	24	200-1200	APPE SICI	
50 <i>Melampophilax vestinorum</i> *							1	1	1							1							1	1	1	490	APCS	
51 <i>Enoicyla costae</i> *							1	1	1							1							1	1	1	290	WME	
52 <i>Stenophylax mitis</i>	1	2	2										1	2	1	2							2	4	3	680-1040	MED	
53 <i>S. mucronatus</i>																			1	2	1		1	2	1	1340	SEU	
54 <i>Micropterna fissa</i>										1	2	1				1							1	2	1	240	EUR	
55 <i>M. malaspina</i>				1	3	3										1							1	3	3	1200	EME	
56 <i>M.nycterobia</i>	1	3	3				1	1	1							2							2	4	4	1040-1430	EUR	
57 <i>M. sequax</i>				1	3	2										1							1	3	2	850	EUR	
58 <i>M. testacea</i>										3	4	3	1	1	1	2							4	5	4	240-900	EUR	
59 <i>Mesophylax aspersus</i>				1	1	1	1	1	1	3	11	5				3							5	13	7	130-600	EME	
60 <i>Allogamus antennatus ausoniae</i> *				5	174	16	6	169	12				1	1	1	3							12	344	29	460-1200	APCS	
61 <i>Chaetopteryx gessneri</i> *	1	1	1	1	2	1	2	19	3							3							4	22	5	480-1040	ALAP	
GOERIDAE																												
62 <i>Silo mediterraneus</i> *	1	12	2	2	66	13	4	132	14				1	4	2	4							8	214	31	480-1200	TYRR	
LEPIDOSTOMATIDAE																												
63 <i>Lepidostoma hirtum</i>	1	1	1													1							1	1	1	750	SIE	
64 <i>Crunoecia irrorata</i> *							1	1	1							1							1	1	1	480	EUR	
LEPTOCERIDAE																												
65 <i>Atrypsodes morettii</i> *							4	22	4	2	3	2				2							6	25	6	34-560	APPE SICI	
66 <i>Mystacides azurea</i>							1	1	1							1							1	1	1	450	PAL	
67 <i>Leptocerus tineiformis</i>							1	1	1							1							1	1	1	34	EUR	
SERICOSTOMATIDAE																												
68 <i>Sericostoma italicum</i> *	1	11	2	3	23	9	7	30	10	1	1	1				4							12	65	22	460-1200	APCS	
ODONTOCERIDAE																												
69 <i>Odontocerus albicorne</i>				3	25	5	3	14	5				2	48	4	3							8	87	14	168-1100	EUR	
Total specimens	122			1060			901			377			196				9			2								
Total species	22			32			40			13			18				5			1								
N. species exclusive to a one biotope	4			7			17			3			2							1								
Total sampling for each biotope	22			55			98			39			30				7			1								